



Executive Summary

1.0 Introduction

The City of Calgary retained ISL Engineering and Land Services Ltd. (ISL) to conduct a transportation corridor study along Shaganappi Trail made up of two components:

1. A Corridor Study from north of 16 Avenue N to Crowchild Trail NW.
2. A High Occupancy Vehicle (HOV) Implementation Study from north of 16 Avenue N to Stoney Trail NW.

The study was necessary due to the re-designation of Shaganappi Trail south of Crowchild Trail to an Arterial Street standard from a Skeletal Road standard within the 2009 Calgary Transportation Plan (CTP). An Arterial Street standard provides a high-quality environment for all modes of transportation and is the most common type of street in the transportation system. A Skeletal Road promotes the movement of vehicular traffic over long distances, and typically operates at high speeds with little direct access and interaction with adjacent land uses. The CTP also identifies Shaganappi Trail as part of the Primary Transit Network, Primary HOV Network, and part of the Primary Cycling Network. The Shaganappi Trail Corridor Study was also required in order to consider other planning initiatives in the area such as the University of Calgary Master Plan, West Campus Master Plan and South Shaganappi Communities Area Plan.

The purpose of the study was to confirm a long-term vision for the Shaganappi Trail corridor that provides for all modes of transportation, including active modes (walking and cycling), transit, and high-occupancy and single-occupancy vehicles (SOV).

Like many long-term transportation corridor studies undertaken by The City's Transportation Planning business unit, the Shaganappi Trail Corridor Study project team sought to create a recommended plan for the corridor that adheres to and balances the priorities of City of Calgary policy, is reflective of the values and perspectives of citizen and stakeholder input, meets technical requirements for safe and efficient street design, and is fiscally responsible.

The remainder of this introduction will highlight some of the key considerations the project team incorporated into the recommended plan and summarize how the outcomes of the recommended plan create a balanced solution for the corridor. Following the introduction, the Executive Summary includes the detailed description of the process undertaken to create the recommended plan, including:

- Existing conditions of the Shaganappi Trail corridor
- Traffic forecasting and analysis
- Corridor options and evaluation
- Transit / HOV corridor considerations
- Recommended plans
- Public engagement process

It is noted that, at the onset of the study, the corridor review included the complex 16 Avenue / Shaganappi Trail NW interchange. Based on initial public engagement and collaboration with City departments including Land Use Planning and Policy, this area was subsequently removed from the scope of the study, in recognition of the value of completing a separate study for this underutilized area along the Bow River.

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1.1 Key Considerations of the Shaganappi Trail Corridor Study

Key considerations of the study included:

- Create a new Shaganappi Trail corridor plan that aligns with the 2009 CTP designation change of Shaganappi Trail from a Skeletal Road to an Arterial Street and includes the following:
 - Consider Shaganappi Trail's new function as designated by the CTP, which looked at the entire transportation network in The City, and determined that Shaganappi Trail no longer needs to be a free-flow expressway to accommodate future traffic demand in the network.
 - Accommodate for future traffic volume increases, with City forecasting indicating that Shaganappi Trail would be 40% over-capacity by 2039 if no changes are made to the existing four-lane configuration. These gridlock conditions would particularly create unreliable transit service as buses would have no ability to bypass peak-hour congestion. This, in turn, would inhibit the ability of Shaganappi Trail to be used as a Primary Transit route as designated by the CTP and the RouteAhead plan, providing high quality BRT service connections to the NW-HUB transit area.
 - Accommodate use as a Primary HOV route, as designated by the CTP.
 - Accommodate use as a Primary Cycling route, as designated by the CTP. Shaganappi Trail is a strategic link in the northwest cycling network due to its direct connection to popular destinations such as the Bow River Pathway, residential communities and major Activity Centres including the University of Calgary, West Campus and Market Mall.
- Update an existing, outdated, previously approved Shaganappi Trail corridor plan developed in 1970 that no longer meets the needs of the 2009 CTP. In the absence of a new corridor plan, the 1970 Shaganappi Trail corridor plan that is currently in place would:
 - Upgrade Shaganappi Trail to a free-flow expressway with limited access via interchanges.
 - Close the existing intersections at Varsity Drive and Valiant Drive.
 - Physically separate planned BRT service from adjacent land uses.
 - Provide no accommodation for active modes of transportation
 - Require acquisition of about 30 homes on the west side of Shaganappi Trail in areas of constrained right-of-way.
- Consider the values and concerns of area residents including the reduction or elimination of residential and business property acquisition, maintaining residential property access, parking and quality of life for those residents along Shaganappi Trail.
- Incorporate the input of citizens and stakeholders into the decision-making process for the corridor and if feedback can't be included, explain the reasons why not.
- Create a stakeholder and citizen engagement program that adheres to The City's engage! Policy.
- Recognize that Shaganappi Trail is an existing road corridor with significant property constraints between 40 Avenue N and Crowchild Trail NW, which limits the space available for expansion. The southern part of the corridor, from north of 16 Avenue N to 40 Avenue N does not have the same property constraints. Ultimately, a recommended plan must integrate balanced solutions in areas with and without property constraints.

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1.2 Key Outcomes of the Shaganappi Trail Corridor Study

The following are key outcomes of the Shaganappi Trail Corridor Study:

- The recommended plan would see the entirety of the corridor widened to a six-lane basic cross-section, with the new exterior lanes designated for Transit / HOV-only use by buses and carpools. This aligns with the 2009 CTP by including the following:
 - The recommended Shaganappi Corridor Study plan reflects an Arterial Street standard that provides for a high quality environment with a multi-modal focus and significant new connections for pedestrians, cyclists, and transit and carpool users.
 - The increase from a four-lane to a six-lane configuration with an exterior Transit / HOV lane will benefit all users. All drivers will see moderate benefit through the capacity improvements provided by HOV, while transit service will gain a significant advantage by using the Transit / HOV lane to attain efficient peak period service.
- The recommended plan accommodates for Shaganappi Trail to function as part of the Primary Transit Network with the addition of the outer Transit / HOV lane, creating a facility that will provide consistent transit service along the length of Shaganappi Trail. This accommodates the planned BRT service on Shaganappi Trail, which is included as a longer-term priority in the RouteAhead transit plan, using Shaganappi Trail to connect the Northpoint Terminal to the NW-HUB transit area near the West Campus.
- The recommended plan accommodates for Shaganappi Trail to function as part of the Primary HOV Network with the addition of a northbound and southbound outer, Transit / HOV-only lane. The addition of a dedicated HOV lane will also improve operations for general (single-driver) traffic by shifting transit and carpool traffic to the dedicated lane. It would also be possible to designate the HOV-only use during peak periods, allowing the lane to benefit all users during off-peak and weekend periods.
- The recommended plan accommodates for Shaganappi Trail to function as part of the Primary Cycling Network. There will be two approaches to adding continuous cycling facilities to the corridor. Dedicated one-way bike lanes will be added where there are no property constraints and will connect to "shared use" residential streets in the constrained areas through Varsity. Space is also provided to physically separate the bike lanes from adjacent traffic lanes, enhancing safety for all users. The Shaganappi Trail cycling facility will provide the major north-south commuter cycling connection between residential areas in northwest Calgary and the Bow River Pathway System.
- The recommended plan for Shaganappi Trail incorporates and reflects most of the feedback received from area residents, especially those most affected by the project in the constrained area between 40 Avenue N and Crowchild Trail NW. Through a two-year long engagement process, options were evaluated, eliminated or refined based on the feedback received. The recommended plan is based directly on community priorities, which significantly included the reduction and elimination of residential / commercial property impacts. The plan does achieve this critical objective, retaining all existing homes, on-street parking, and space to maintain existing sound walls, where desired by residents.
- The recommended Shaganappi Trail corridor plan would replace the outdated 1970 plan as the plan "on record", and bring assurance to affected residents that they are not at risk of the significant property acquisition included in the 1970 plan.

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2.0 Existing Conditions

The Shaganappi Trail corridor has geometric features that conform to the former City of Calgary Expressway and Major Road (arterial) standards. Review of roadway geometry generally confirmed that the road has no significant deficiencies, and no horizontal or vertical alignment revisions are recommended.

The existing right-of-way (ROW) along the Shaganappi Trail corridor varies significantly, from 63 m near Market Mall, to 53 m by Nose Hill Park, to 45 m by Shaganappi Village in Varsity. The existing road has a minimum of four lanes, and widens to five or six lanes in certain areas. The sections between 40 Avenue N and Valiant Drive and between Varsity Drive and Crowchild Trail are the most constrained. The existing 45 m cross section accommodates not only Shaganappi Trail itself, but also parallel residential frontage streets. The four residential frontage streets on both sides of Shaganappi Trail – all named Voyageur Drive – typically provide a two-way driving width of 4.6 to 4.9 m, plus on-street parking. Typical existing sections are illustrated on Exhibits ES-7 and ES-8.

Existing access along the corridor is well controlled and generally conforms to The City's Arterial Street standards, which require spacing of 300 m between intersections. The one minor exception is the 280 m spacing between the 40 Avenue N and Valiant Drive intersections.

Active modes are not well accommodated along Shaganappi Trail today. Some sections have parallel sidewalks or pathways, particularly north of Valiant Drive, but there is no continuous way to walk or bike along the street. Access across Shaganappi Trail is provided at signalized intersections, plus three pedestrian overpasses located at Market Mall, Valiant Drive and north of Crowchild Trail. The overpass at Valiant Drive has staircase access, so does not meet current accessibility guidelines for users with restricted mobility. Shaganappi Trail is designated as a Primary Cycling route in the CTP.

The RouteAhead plan identifies the need for BRT Service along Shaganappi Trail from Northpoint Terminal to the NW-HUB transit area near West Campus. Transit service is not currently provided along the length of Shaganappi Trail. Several local bus routes operate on short segments, generally providing feeder bus service to the Brentwood LRT station. Retaining existing conditions on Shaganappi Trail "as is" would limit The City's ability to provide BRT service along the corridor in the future.

3.0 Traffic Forecasting and Analysis

Intersections within the Corridor Study area (from Crowchild Trail south) were analyzed to determine existing and future conditions. Analysis of existing conditions confirmed that the 40 Avenue N and Crowchild Trail northeast junction intersections have major movements above capacity in the afternoon peak period today, while Varsity Drive has movements over capacity in both the morning and afternoon peak periods.

The projected travel demand for Shaganappi Trail was provided by The City using the Calgary Regional Transportation Model (RTM) PlanIt / Calgary Metropolitan Plan (CMP) Scenario Series – 2039 Target forecast, reflecting the transportation system targeted by the CTP over the next 25 years.

From the 2039 horizon forecast, general traffic patterns were observed to include a significant peak direction split that tends heavily to southbound movements (toward the University and downtown) in the morning, and northbound movements (away from these centres) in the afternoon. Daily traffic volumes decline from north

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to south, from 50,000+ vehicles per day (vpd) near Varsity Drive to 30,000 vpd near West Campus Way, clearly reflecting travel demand to the University of Calgary / Foothills Hospital areas.

Analysis of future conditions considered four possible laning options, as summarized in Table ES-1 below.

Table ES-1 Basic Laning Options on Shaganappi Trail

Laning Option	Description	Basic Laning	Total Basic Lanes
1	Retain Existing Lanes	4 General Lanes	4
2	Widen for All Users	6 General Lanes	6
3	Widen for Transit / HOV	4 General Lanes + 2 Transit / HOV Lanes	6
4	Widen for All Users	6 General Lanes + 2 Transit / HOV Lanes	8

In general, the operational assessment of the corridor demonstrates that there is benefit in widening Shaganappi Trail in the future. The “do nothing” scenario of maintaining existing lanes (Laning Option 1) would operate more than 40% over-capacity in peak periods, creating grid-lock conditions that would negatively impact all modes of travel and likely result in “short-cutting” traffic patterns through adjacent communities. The congested sections would also significantly impact transit operations, giving buses little opportunity to bypass peak-hour congestion. Reliable BRT service is therefore not possible on Shaganappi Trail without consideration of additional lanes. On this basis, Laning Option 1 (do nothing) was not considered further.

Among the remaining options, Laning Option 4 (total of eight lanes, with four in each direction) would provide the highest operational improvement, but would not provide substantial benefit relative to three basic general purpose lanes (Laning Option 2). Thus, it is a case of diminishing returns, with little substantive benefit for the additional investment. Furthermore, constructing a total of eight basic lanes on Shaganappi Trail would disproportionately impact surrounding neighborhoods, and would be unsuitable as a multi-modal arterial street corridor, creating a more forbidding environment for walking and cycling movement along and across the corridor. On this basis, Laning Option 4 (8 total lanes) was not considered further.

Having eliminated both of the above options, it was determined that a basic six-lane section is the optimal configuration for Shaganappi Trail in the future, allowing for comparison of Laning Options 2 and 3 (six lanes either with or without the Transit / HOV lanes). From this comparison, it is recommended that the additional lane be designated for Transit / HOV-only use, incorporating both transit vehicles and carpools (Laning Option 3). Reasons for this recommendation include:

- Based on The City's forecasts, the addition of the Transit / HOV-only lane will improve operations for all users, including single-occupant vehicles and other traffic movements in the remaining lanes.
- Accommodates the planned BRT service identified on Shaganappi Trail in the RouteAhead plan.
- Transit / HOV-only lanes could initially operate during peak hours only, providing the additional capacity for all users at other times of the day, and on weekends.

Based on this recommendation, all subsequent evaluation for the Shaganappi Trail corridor focused on options to attain a six-lane cross-section with Transit / HOV-only designation in the outer lanes.

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4.0 Corridor Options and Evaluation

Evaluation of options for Shaganappi Trail covered five areas, as follows:

1. Network-Level Evaluation
2. Confirmation of Design Criteria
3. Confirmation of Evaluation Criteria
4. Varsity Area Options and Evaluation
5. Intersection Options and Evaluation

The network-level evaluation re-confirmed the findings of the CTP, highlighting the benefit of providing Primary Transit, Primary HOV and Primary Cycling facilities along Shaganappi Trail. Evaluation of design criteria confirmed safety and design benefits gained by planning future revisions to Shaganappi Trail at typical speed limits for an arterial street, and by maintaining a standard divided median.

Evaluation criteria for the project were based on The City's Triple Bottom Line (TBL) Policy Framework, which was developed by The City to support Council's 2020 Sustainability Direction. The framework has three themes, Environmental, Social and Economic. When integrated, the three themes together support smart, sustainable growth and urban development, and incorporate and complement traditional evaluation measures for transportation corridor studies, as follows:

- Environmental Themes – air (reduced emissions), land (efficient use of land) and water (accommodates storm water run-off) considerations
- Social Themes – vehicle and vulnerable user safety, public realm, residential impacts, traffic noise
- Economic Themes – traffic flow, capital costs, life cycle costs, business impacts
- Policy Themes – compatibility with MDP / CTP policies, Complete Streets principles

4.1 Varsity Area Options and Evaluation through Public Engagement

The constrained section of Shaganappi Trail through Varsity, between 40 Avenue N and Crowchild Trail, was the most technically challenging and posed the greatest number of trade-offs required to meet the City's overall mobility objectives for the corridor. Much of the evaluation process focused on this area, where the refinement of options was ultimately able to be expanded to inform the best solutions for the corridor as a whole.

The refinement of the corridor options was done through Shaganappi Trail Corridor Study's extensive public engagement program. The project team presented options that would each meet The City's technical requirements and sought stakeholder and community input to help create and recommend a plan for the corridor that would be acceptable for the community. Each phase of engagement included multiple engagement opportunities for stakeholders, homeowners and members of the general public. Feedback provided during each engagement phase was incorporated into the concepts and directly influenced the refinement of five original concepts down to the recommended plan.

Initially, five options were developed for the constrained section through Varsity. All of the options adopted the six-lane section with Transit / HOV-only lanes, with the exception of the reversible lanes concept, which adopted a five-lane section. The characteristics of each option are summarized in Table ES-2 below.

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Table ES-2 Preliminary Concepts

Concept	Description	Characteristics
1	Widen on Centre	Acquire homes on both sides of Shaganappi Trail, and construct standard Complete Streets section, widening to both sides.
2	Widen to East	Acquire homes on the east side of Shaganappi Trail only, and construct standard Complete Streets section, widening to the east side only.
3	Widen to West	Acquire homes on the west side of Shaganappi Trail only, and construct standard Complete Streets section, widening to the west side only.
4	Reversible Lanes	Add reversible lane in median of Shaganappi Trail. Provide HOV-only reversible lane in peak directions, and use as left-turn lane in off-peak periods. Left turns off of Shaganappi Trail not permitted in peak periods.
5	Constrained Widening	Acquire a 1 to 4 m area within the front yards of adjacent homes, relocate the residential frontage street outwards with one-way operation, and accommodate the widened Shaganappi Trail between.

Stakeholder feedback through an open house eliminated Concepts 1 and 4 early in the process, and refined evaluation of the remaining options was then completed at a Community Conversation workshop. Public input helped prioritize the evaluation parameters, and broadly confirmed that the most important factor would be to reduce and minimize residential property impacts. Based on the stakeholder feedback in these sessions, Concepts 2 and 3 were also eliminated from further consideration. They both required the acquisition of 20+ residential properties, which was found to be clearly outside public and City priorities for this project.

The original Concept 5, with a reduced cross section and revision of the Voyageur Drive frontage streets to one-way operation, was carried over to the detailed evaluation stage. Two additional concepts were developed, which were two variations on Concept 5, based on the idea of eliminating the Voyageur Drive frontage street and retaining the adjacent homes with direct frontage on Shaganappi Trail. As before, all concepts retained the primary mobility objectives for Shaganappi Trail, including the provision of six total lanes, with Transit / HOV-only designation on the exterior lanes. The characteristics of each option are summarized in Table ES-3 below.

Table ES-3 Refined Options

Option	Description	Characteristics
5A	Constrained Section	Retain a narrower Voyageur Drive as one-way frontage streets. Accommodate Shaganappi Trail and a single shared multi-use pathway between the residential streets.
5B	On-Street Parking	Remove Voyageur Drive, but provide on-street parking directly on Shaganappi Trail to service adjoining properties. Cycling accommodated on shared multi-use pathways (both sides).
5C	Bike Lanes	Remove Voyageur Drive, and do not replace on-street parking. Cycling accommodated on parallel one-way bike lanes on either side of Shaganappi Trail.

The refined options were the basis for additional public input in November 2013, with a series of Community Conversations intended to continue the dialogue and confirm if the refined options met the intent of the original feedback received earlier in the year.

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From the community sessions, there was a clear preference from affected homeowners to maintain Voyageur Drive access through the constrained Varsity area. Although Options 5B and 5C met the intent to minimize outright property acquisition, the new property impacts introduced by converting homes to Shaganappi Trail frontage, were not met favorably by the residents. The residential frontage road was seen as particularly valuable in providing a safety buffer to the busier road on Shaganappi Trail, providing a comfortable and “quiet” front-street space for children and vulnerable users and allowing for on-street residential parking as well as maintaining access to existing driveways.

Through the Community Conversation workshops in November of 2013, the project team also heard from other stakeholders outside of the constrained Varsity area. The stakeholders outside of the Varsity area did not have the same space constraints or residential concerns with on-street parking and access to homes. The project team heard from this group of stakeholders that Option 5C, which accommodates all users to high standards, would be a preferred option in areas with fewer constraints. Option 5C, with buffered one-way cycling lanes, is also consistent with The City’s recently-approved Complete Streets standards.

On the basis of the clear public feedback, an integrated plan was developed and refined for the corridor as a whole. Option 5A, with one-way residential streets, was used in Varsity, while Option 5C with a standard Complete Street cross section was used in areas without space constraints. A similar approach with one-way frontage streets has been successfully used elsewhere in The City along Bow Trail from Sarcee Trail to 37 Street SW and, in a commercial area, on Macleod Trail north of Heritage Drive. These two options were combined to create an integrated recommended plan for the corridor study area.

The key remaining change that was needed to integrate the two different corridor options was to leverage the one-way Voyageur Drive frontage streets in Varsity as a means to provide continuity for the one-way bike lanes elsewhere in the corridor. Shifting the cycling mode to a shared on-street space on the residential street was found to provide a number of advantages, including:

- Provision of an unbroken, parallel one-way cycling system on both sides of Shaganappi Trail.
- Allows for moderate widening of the remaining one-way driving lane on Voyageur Drive, and incorporation of additional shoulder and snow storage space on Shaganappi Trail.
- Cycling is not adversely affected by sharing space on Voyageur Drive, which are low-volume, residential streets.
- Having Primary Cycling designation on their streets benefits the residents of Voyageur Drive by assigning higher winter maintenance priority.

The resulting, integrated corridor plan was reviewed again with residents of Voyageur Drive at a dedicated Community Conversation session in April 2014, and then with the broader public at a final Open House in May 2014. A final review of the plan against City objectives and resident feedback was prepared and is summarized in Tables ES-4 and ES-5 below. The engagement sessions confirmed that the refined, integrated plan was generally supported by affected residents, and directly addressed most of the concerns raised in prior engagement activities.

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Table ES-4 Final Evaluation of Recommended Option 5A/5C – City of Calgary Objectives

Project Objective	Achieved?	
	Yes	No
Primary Cycling route accommodated?	✓	
Primary Transit route accommodated?	✓	
Primary HOV route accommodated?	✓	
Continuous pedestrian route accommodated?	✓	
Safety / design considerations?	✓	

Table ES-5 Final Evaluation of Recommended Option 5A/5C – Resident Feedback

Resident Priority	Achieved?	
	Yes	No
Retain Voyageur Drive	✓	
Retain on-street parking in front of houses	✓	
Retain driveway access in front of houses	✓	
Retain two-way traffic on Voyageur Drive <ul style="list-style-type: none"> Reason for variance: The existing cross-sections of Voyageur Drive are already considered to be too narrow for practical two-way operation. The constrained right-of-way of Shaganappi Trail / Voyageur Drive was balanced to achieve a wide array of objectives, and providing additional widening to accommodate safe two-way operation of Voyageur Drive would require direct residential property acquisition. The remaining one-way driving lane on Voyageur Drive will provide for safe emergency access while maintaining on-street parking and front-drive access. 		✗
Pave / maintain back alleys used for access	✓	
Separate pedestrians and cyclists	✓	
Allow for noise wall for those who want one	✓	
Do not impact houses	✓	
Reduce median width on Shaganappi Trail <ul style="list-style-type: none"> Reason for variance: After discussion with adjacent homeowners, it is understood that reducing the median had been suggested primarily as a means to achieve the other objectives above, such as maintaining parking. Since these objectives were achieved without reducing the median, it was no longer considered a priority. From a corridor perspective, the median width of 4.5 m on Shaganappi Trail accommodates for left turn lanes at intersections. Elimination of left turn lanes would significantly restrict community access and create operational issues for all users. The median also provides for safe separation of opposing lanes of traffic and space for snow storage in winter. 		✗

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4.2 Intersection Options and Evaluation

As the evaluation process proceeded for the overall corridor, individual evaluations were completed for specific intersections along the corridor, to confirm preferred approaches for the Arterial Street conversion and accommodation of active modes. These evaluations are summarized below:

- West Campus Way – evaluation of transit priority options recommended for the provision of a right-side “jug handle” to allow bus-only priority access to the NW-HUB transit centre and West Campus area. This means that buses can stay on the right-hand side of Shaganappi Trail, without having to cross all lanes and execute a left turn.
- 32 Avenue N – evaluation recommended revision of right-turn radii to Arterial standards, and provision of dual lefts bays to improve traffic flow in the Market Mall area.
- Market Mall Access – the study found that an additional all-turns access can be accommodated between 32 Avenue N and 40 Avenue N, but that a final location can be determined as part of a future development application process, if needed to support transit-oriented redevelopment plans.
- 40 Avenue N – evaluation was completed for an option to relocate 40 Avenue N to the south. Although the option provides some benefits in terms of intersection capacity and accommodation of transit, The City ultimately determined not to proceed with this option due to property impacts at Market Mall.
- Valiant Drive – evaluation confirmed the benefit of opening the existing intersection to all-turns access. A signal with at-grade pedestrian access is also effective in providing alternate pedestrian access, following removal of the sub-standard pedestrian overpass at this location. The at-grade crossing will also avoid the significant cost and property impacts of constructing a new pedestrian overpass with fully accessible access ramps. Note that the opening of the intersection to all-turns does not add any new access into Varsity, as the existing intersection already accommodates inbound movements. It does, however, add a new left turn out of Varsity, improving the ability of community members to exit the area, and allowing for a potential shift of left-turning traffic from Varsity Drive. The constrained ability to turn left at Varsity Drive was a key issue raised by the community, and this change directly addresses this concern.
- Varsity Drive – input from the Varsity Civic Affairs Committee and other community members resulted in evaluation of a number of concerns, resulting in such recommendations as better defining turn lanes on Varsity Drive at the Shaganappi Trail intersection and closing one of the three driveways serving the commercial lot closest to Shaganappi Trail, to improve safety.
- Crowchild Trail – evaluation confirmed that historic planning for a third-level flyover carrying a high-speed expressway section of Shaganappi Trail over Crowchild Trail into the Varsity area would no longer be used, as it is not warranted by traffic demand and is inconsistent with the character of Shaganappi Trail as a multi-modal Arterial corridor. The widened section of Shaganappi Trail can be carried over the existing bridges by reducing shoulder / shy space and constructing new, parallel pedestrian bridges. It was also confirmed that converting the eastbound right turn movement to a dual right turn controlled by signals is an effective solution to maintain high traffic capacity while eliminating weaving issues on Shaganappi Trail south of Crowchild Trail and enhancing pedestrian safety by reducing traffic speed.

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5.0 Transit / HOV Corridor

Improved accommodation of transit and other high occupancy vehicles can be beneficial to the transportation network by reducing reliance on single-occupant vehicles and making public transit more appealing by improving travel times and system reliability. The CTP identified an interconnected network of future HOV facilities through the Primary HOV network, which includes Shaganappi Trail as the primary north-south HOV route through northwest Calgary. The RouteAhead strategic plan for transit also identifies Shaganappi Trail as a future BRT corridor.

Implementation of dedicated Transit / HOV lanes on the Arterial section of Shaganappi Trail south of Crowchild Trail will provide enhanced performance for BRT, transit and carpools, while also improving operations for other users in the existing lanes. Targets from The City's forecasting indicate that about 15 to 20% of traffic demand on the corridor will be HOV-based in both buses and carpools by 2039, translating to about 10,000 vpd. Accommodating this demand with an exclusive lane will thus serve more than 20,000 drivers and passengers on a typical weekday. The Transit / HOV-only lanes have been recommended on the exterior (curb-side) lanes, which minimize turn conflicts and provide direct access to bus stops for the BRT and other transit services.

North of Crowchild Trail, Shaganappi Trail will ultimately be upgraded to a free-flow facility with interchanges at all existing intersection locations, consistent with its classification as a Skeletal Road in the CTP. At this future stage, the corridor will have high capacity for all modes of transportation, and dedicated Transit / HOV-only lanes would offer little relative benefit for either transit or carpool users, since all users would operate at a high level of service regardless. In light of the lack of travel-time advantage, and challenges in connecting skeletal-type HOV facilities with the exterior Transit / HOV lanes on the Arterial section south of Crowchild Trail, it is recommended that HOV-only lanes not be provided at the ultimate stage of Shaganappi Trail, north of Crowchild Trail. Bus lay-bys would be provided for any BRT stops on the corridor.

In the interim, Shaganappi Trail north of Crowchild Trail will retain traffic signals at all major intersections. During this stage of development, exterior Transit / HOV-only lanes are recommended to provide benefits such as travel-time enhancement, improved transit reliability for planned BRT services, and continuity with the system south of Crowchild Trail. Construction of the Transit / HOV lanes is also convenient and cost-effective, as space has been previously preserved either in the median or to the outside of Shaganappi Trail for additional lanes in both directions. These interim Transit / HOV-only lanes will also benefit all users by shifting demand and enhancing capacity of the existing lanes for all drivers.

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6.0 Recommended Plans

Shaganappi Trail is an existing road corridor with significant property constraints. As a retrofit project in an established area, application of greenfield design standards, including geometric design parameters and traffic operation objectives, is not suitable in many areas of the corridor. Through the public engagement process, The City considered public feedback which placed highest priority on minimizing property impacts. As such, several trade-offs were considered and accepted by The City to achieve an acceptable overall plan, particularly in areas on constrained right-of-way. These design decisions are documented in the final report for reference by future designers.

The ultimate plan for Shaganappi Trail has been significantly updated. Historic planning had envisioned Shaganappi Trail as a free-flow expressway facility with limited access via interchanges, and no accommodation of active modes of transportation. The newly-recommended plan is substantially different; reflecting the revision of the southern section of Shaganappi Trail to an Arterial Street classification with enhanced accommodation of transit, walking, and cycling modes. The entirety of the corridor will be widened to a six-lane basic cross-section, with the new exterior lanes designated for Transit / HOV-only use by transit and carpools.

The recommended corridor plans are illustrated in Exhibits ES-1 through ES-6, with typical cross-sections illustrated on Exhibits ES-7 and ES-8.

6.1 Interim Plans

Shaganappi Trail is not currently part of The City's 10-year capital plan for transportation infrastructure, and is expected to be upgraded in future in response to specific development patterns in the area. However, through the public engagement process, Varsity Drive was identified as a priority area, and interim plans were developed for this specific area to confirm that elements of the ultimate plan can be accommodated in the shorter-term on a low-cost basis. The resulting interim plans, which include intersection revisions at Varsity Drive and Valiant Drive, are illustrated on Exhibit ES-9. The interim plan would retain the pedestrian overpass at Valiant Drive on an interim basis, combined with a new at-grade crossing on the north side of the intersection.

6.2 Property Plans

No property acquisition is required to implement the recommendations of the Shaganappi Trail Corridor Study. A total of 13.3 hectares (33 acres) of surplus land area has been identified, although a number of areas have been flagged for possible protection in relation to stormwater management, roadway sloping or protection for additional geometric revisions in future. These areas are shown on the property plans in Exhibits ES-10 through ES-15. It is recommended that the relevant issues be studied in greater detail before The City divests or sells any surplus land in these areas.

6.3 Cost Estimates

A planning-level (Order of Magnitude) Opinion of Probable Cost was prepared for the recommended corridor plan. The estimated order-of-magnitude cost of implementing the ultimate Shaganappi Trail corridor plan from Crowchild Trail to north of 16 Avenue N is \$73 Million (2014 dollars), while the cost of the interim improvements at Valiant Drive and Varsity Drive are estimated at \$1.2 Million (2014).

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7.0 Public Engagement

The Shaganappi Trail Corridor Study included extensive public engagement through every stage of the project and adhered to The City's engage! Policy. Each phase of engagement included multiple engagement opportunities for stakeholders, homeowners and members of the general public. Feedback provided during each engagement phase was incorporated into concepts and directly influenced the refinement of five original concepts down to the recommended plan. Where feedback was not incorporated into the plan, the project team reported back to stakeholders and citizens the reasons why feedback could not be included. The project team held numerous meetings with the Varsity Civic Affairs Committee, to review matters of concern in the most constrained corridor sections around Varsity Drive and Valiant Drive.

The engagement process also evolved through the project in response to previous feedback, providing more engagement opportunities than had been planned at the outset of the study. The study was completed concurrently with The City's development of a Transportation Corridor Study Policy, and was considered to model many of the principles that were later adopted for the new policy. The overall engagement process is summarized in Table ES-6 below.

Table ES-6 Project Engagement Process

Phase	Purpose	Dates
1	Stakeholder introduction	July 2012
2	Public introduction and review of preliminary concepts	Oct / Nov 2012
3	Community conversations to review preliminary concepts	March / April 2013
4	Community conversations to review refined options	Oct / Nov 2013
5	Review recommendations with adjacent homeowners	Feb / April 2014
6	Open house to review recommended plan	May 2014

8.0 Final Summary

The Shaganappi Trail Corridor Study consisted of two major components:

1. A Corridor Study from north of 16 Avenue N to Crowchild Trail NW.
2. A High Occupancy Vehicle (HOV) Implementation Study from north of 16 Avenue N to Stoney Trail.

The re-classification of Shaganappi Trail south of Crowchild Trail to an Arterial Street standard represents a fundamental change from how the corridor has been planned in the past. The multi-modal focus of the recommended corridor plan provides for significant new features for transit, carpool users, pedestrians, and cyclists, while also enhancing the corridor for all drivers by increasing overall capacity and enhancing safety characteristics. The recommended plan also recognizes and is sensitive to existing communities along Shaganappi Trail. The most constrained area through Varsity required extensive technical evaluation and public engagement, and resulted in a plan that can be implemented without any property acquisition, either residential or commercial. This is a significant shift from the 1970 corridor plan, which would have seen significant neighborhood impacts to implement a free-flow expressway facility. The recommended plan provides a level of certainty for residents living next to Shaganappi Trail in the Varsity area, knowing that upgrades to Shaganappi Trail that benefit tens of thousands of daily users can now be achieved in complementary balance with their priorities and continued quality of life in the area.